Robert G. Simpson, Director
Training School
State Normal College,
Bowling Green, Ohio
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Educational Research Bulletin

THE USE OF ACTIVITY ANALYSIS IN CURRICULUM CONSTRUCTION[1]

W. W. CHARTERS
Ohio State University

ANALYSIS has ancient lineage and respectable antecedents. The processes for which it stands were discovered and named by the Greeks many centuries ago as the root meaning of the word indicates. The terms—logical analysis, grammatical analysis, chemical analysis, and even psychoanalysis—show that its use is still common in many fields. Recently, however, analysis has fallen upon less fortunate days; it has become attached to low associates of which we have heard much. "Job analysis" is the term of doubtful respectability to which exception is taken in some educational circles. It smells of sweat and dirty hands—or so it appears to many educators who look upon the term with some distrust.

Those of us, therefore, who associate with job analysis have invented synonyms with fewer low associations and speak of "activity analysis," "trait analysis," "occupational analysis," "functional analysis," and the like. But they are all members of the same tribe and are descendants from old chief Job Analysis.

To locate the function of activity analysis in education it is necessary to describe the curriculum situation in which it is used. The major problem of a curriculum-maker lies in the selection of materials. Hundreds of thousands of books, monographs, and bulletins have been written; and each volume contains something of use to those who wish to learn. Of unrecorded and useful experiences not yet reduced to writing there is a mass much larger than printed literature. More new and useful ideas are being discovered every day than any learner can hope to master. In the catalogue of one of the smaller universities enough courses actually are listed to keep one student engaged for eighty-five years at the rate of thirty semester hours a year. Obviously, the necessity for selection is beyond debate. It has been recognized from the beginning of textbook-making.

Two bases for selection have been used. Educators of the right wing who are in the majority in colleges of arts and science claim that the best books for the learner are overview books. Through traditional forces these educators profoundly influence the high school and to a lesser, but still important, degree the elementary school. They believe that the course in physics should contain fundamental principles of heat, light, electricity, and sound; a course in

[1]An address delivered before Convocation of the University of the State of New York, October 19, 1928.

botany, the principles of physiological and anatomical botany; and a course in history should reveal the great movements of civilization. In short, with weighty arguments, they support the position that the best information for students are the products of racial research organized in a concise and scholarly fashion.

Another group of educators, the left wing, support the position that texts for learners should originate in the problems, activities, and interests of modern life. They say that children and adults of 1928 have important problems to solve and essential activities to carry on. The left wing will, of course, use the best products of scholarly activities; but they will not use all the fundamentals of all subjects; and they are not concerned, to any painful extent, with systematic organization of the great fields of knowledge. The educators of the left wing first discover modern problems; then they select whatever is known that will be useful in the solution of these problems. They hew to this line, and let the chips fall where they may.

There is inevitably a third group, the center, whose members accept the principle of practical use with the left wing and at the same time appreciate, with the right wing, the necessity for systematic organization on occasions that are pedagogically and psychologically appropriate. Activity analysis is useful to this group as a technique for determining the activities, problems, and difficulties of those who are to be taught. The educators of both the left wing and the center must necessarily use this means of discovering the topics which should belong in the textbooks they write.

Such an analysis may be either informal or scientific. The informal type of analysis is carried on by the textbook-maker himself. He may have had long experience with the students for whom he writes, and upon this basis he selects what he believes to be useful material. His agricultural chemistry contains what he feels the agriculturist needs to know about chemistry. His general social science treats of the current problems which he believes are the most important. Because his judgment is not usually so valid as it should be, activity analysis of a systematic and definite sort should be introduced to secure the topics to be treated.

The only function of job analysis—by whatever name it is designated—is to substitute for "hunches" a refined and definite picture of the activities which are to be treated in books and courses of study. Since such is the place of activity analysis in curriculum construction, its uses may be determined, and evidence may be assembled which will show its superiority over selection which is based upon informal judgment.

As our first illustration, let us take the differences which exist between spellers of the old type and the new. Activity analysis has been carried further in spelling than in any other subject because it yields easily to such treatment. The left wing assumed that spelling should be taught chiefly because people write letters out of school and themes in school. From this point the logical step was to analyze letters and themes to see what words were most frequently used and which were most difficult to learn. The underlying pedagogical idea of these investigators was that the words most frequently used should be included in the modern speller, and among those the words which were most difficult to spell should be treated more frequently than those which were easy to spell.

After ten years of analysis by many investigators we now have in the Horn list, for example, ten thousand words beginning with the five hundred words most frequently used in writing, followed by nine other groups of five hundred words arranged in successive order of their frequencies of use. To these are added five thousand still less frequently used words. We also know which of these words are most difficult to learn. We are now in the fortunate situation where the author of each new speller may confine its content to the four or five thousand words found in lists such as that of Horn or others similar to it.

By way of contrast, a speller written fifty-five years ago was selected at random from our Americana of spellers, and a sampling of the words listed in the speller was studied. Among the first fifty lessons which were supposed to be the easiest, 40 percent of the words were not in the ten thousand list at all; 20 percent were in the second five thousand; and only 40 percent were included in the most frequent five thousand. Or in other words, of the eight hundred words in the front of the old speller which seemed to have been selected because they contained only two, three, or four letters each, 60 percent would be rejected by the writers of modern spellers because of infrequency of use. They were short words, but they were odd words.

None of the twenty-four words in the last lesson in this speller belongs to the ten thousand most frequently used words. They seem to be selected because they were hard words to spell; probably they were very useful in spelling matches. The last lesson contains such words as *dissentious*, *breviary*, *ichneumon*, *myrmidon*, *punctilious*, and *emollient*.

A similarly radical change in high-school civics courses has resulted from careful activity analyses. The books on civics written twenty-five years ago discussed the machinery of government—national, state, and local—and the functions of government—legislative, executive, and judicial. These books gave a careful description of the processes of government, but they gave a minimum amount of attention to the problems which faced the electors. Such chapter headings were used as "The State Government," "The State Legislature," "The State Executive," "The State Judicial," "The Two Houses of Congress," and "The Cabinet."

Rugg substituted an analysis of the problems which citizens encounter rather than a list of the activities in which they engage. The series of books prepared by him and his associates has an entirely different organization. The important problems of current life are discussed pro and con; and the machinery of national, state, and local government is introduced as needed. The differences between the civics books of the old and new types are clearly contrasted by comparing the foregoing list of topics from the older books on civics with a few of the headings from the Rugg books which run as follows: "Making a Community Survey," "The Health of the Community," "The Houses We Live In," "Our Newspapers and Magazines," "Groups in the American Town," "Americanizing Our Foreign Born," "How Nations Live Together," and the like.

Illustrations may be taken from the pharmaceutical curriculum—a professional field on the university level. After an analysis of the most desirable duties of the neighborhood druggist had been made and after it was discovered that his uses for pharmaceutical botany were confined

to a knowledge of the gross anatomy of plants sufficient to identify drugs, a comparison with earlier books on pharmaceutical botany was made. The list taken from the textbooks contained approximately eight hundred fifty terms, while the list prepared by an analysis of material derived from appropriate sources showed that about 60 percent of these terms were directly useful to the pharmacist. It was found that the uses of pharmaceutical Latin were confined to reading prescriptions. When a sufficient number of prescriptions had been analyzed, the total list of Latin terms needed by the pharmacist was found to be ninety-three. The typical book on pharmaceutical Latin prepared before the analysis was made consisted of one hundred fifty pages and a vocabulary of fifteen hundred Latin words. Still further, the national syllabus prepared for colleges of pharmacy ten years before this study was made contained no materials dealing with health, but the analysis revealed the necessity for a substantial course on infectious diseases and other problems of health.

Textbooks for teachers have been prepared by individuals without a careful analysis of the activities of teachers. In the teacher-training study just now completed a thoroughgoing analysis of the activities of teachers was made and produced a list of nine hundred fourteen duties. This huge list was evaluated for frequency of performance, for difficulty of learning, and for importance. We now know the duties which are most frequently performed by senior high-school teachers; by junior high-school teachers; by intermediate, primary, and rural teachers. We also know which are the most difficult to learn in the opinion of teachers, principals, supervisors in service and in training schools, professors of education, and teachers in experimental schools. We have judgments also as to the importance of these duties. We also have opinions as to which can best be learned in school and which can most appropriately be acquired on the job. With this information before us it is possible to build courses directly from the lists as well as to check existing courses for the adequacy of the treatment of important topics.

We have found, for example, as an illustration of the superiority of this careful analysis, certain facts concerning a section of a textbook for teachers prepared on the keeping of records and reports. Of the one hundred fifty-three activities listed, one belonged in the second decile in curricular value; nine, in the third decile. Of these one hundred fifty-three activities the author discussed twenty-five and of these one was confined to the ninth decile in importance; ten, to the eighth decile; and six, to the seventh decile. The most important duty was not treated. Two of the nine next in importance and one of the thirteen below that in importance were treated. In other words, it is apparent that if the author had had the results of the activity analysis before him a quite different selection of topics would have been made.

In women's colleges which do not use the results of activity analysis, the required courses are selected for their overview functions. That is, the required courses are usually selected from each of several groups of subjects—one from the biological sciences, one from the physical sciences, and the like. Wherever analysis of women's activities has been made the required courses are radically different. If we assume that

(*Continued on page 355*)

A STUDY OF TEACHER TURNOVER IN CINCINNATI

F. R. JACOBS
Carson School, Cincinnati

THE DISTINCTION between teacher tenure and teacher turnover is often not clearly understood. By "tenure" is meant the length of time for which a teacher holds her position in a given school system; by "turnover" is meant the replacements necessary to maintain a stable working force during a given period. Replacements for any cause—death, retirement, resignation, or dismissal—cause turnover. "Annual turnover" is here defined as the number of replacements caused by permanent separations from the teaching staff, from the close of one school year to the close of the following school year.

In the Cincinnati school system separations from the teaching force are reported under one of the following heads—Death, Retirement, Resignation, or Services Discontinued. Under Death are listed teachers who died while in service. Teachers who give up their positions and could qualify for teachers' pensions are classed under Retirement. Resignation includes all teachers who voluntarily withdraw from the service and cannot qualify for retirement; while teachers who are not reappointed or are dismissed during the school year are placed under the last classification, Services Discontinued.

In Table I appears a summary of the annual turnover of teachers employed by the Cincinnati Board of Education from 1917 to 1927. The figures in Column 8 show that an appreciable reduction in the rate of turnover took place during the ten-year period. The mean percent of turnover for the ten years was 6.6, which means that about one teacher out of every fifteen employed left the service each year.

TABLE I

ANNUAL TURNOVER IN CINCINNATI FROM 1917–18 TO 1926–27

School Year	Number of Teachers Employed	Cause of Withdrawals				Total Turnover	Percent of Turnover
		Death	Retirement	Resignation	Services Discontinued		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1917–18	1,566	8	14	75	13	110	7.0
1918–19	1,551	4	18	68	19	109	7.0
1919–20	1,606	5	8	82	13	108	6.7
1920–21	1,659	10	3	96	1	110	6.6
1921–22	1,693	6	36	62	10	114	6.7
1922–23	1,721	8	22	74	12	116	6.7
1923–24	1,795	8	21	74	15	118	6.6
1924–25	1,863	8	18	89	11	126	6.8
1925–26	1,958	10	22	79	5	116	5.9
1926–27	2,034	10	25	75	10	120	5.9
Mean	1,744.6	7.7	18.7	77.4	10.9	114.7	6.6

The table shows two decided decreases in the percent of turnover for 1919-20 and 1925-26. In 1920, the teachers were granted a substantial increase in salaries; and in 1925, Superintendent Condon appointed a special committee of teachers and principals to work out a new salary schedule. In 1926-27 a new salary schedule was adopted which provided substantial increases for all teachers. The salary increases may not have been entirely responsible for the decrease in turnover, yet the figures would seem to indicate that teachers' salaries are important factors in teacher replacements.

That the rate of turnover varies greatly for the different groups of teachers in the Cincinnati public schools is shown in Table II. An examination of this table brings out the fact that the special-subject groups, with two exceptions, have a much higher rate of turnover than the academic groups. The kindergarten with 11.9 percent and the combined special-subject group with an average turnover of 13.1 percent considerably exceed the average 5.4 percent for the replacements among the teachers of the elementary grades and junior and senior high schools.

The losses caused by death and retirement constituted a large portion of the turnover for the academic teachers, but they were only a small part of the turnover for kindergarten and special-subject teachers. The percents given in Table III show more clearly what portion of the turnover for each of the three groupings came under each head.

More than one-fifth of the turnover for the special-subject teachers was caused by their services being discontinued. This seems to indicate a lack of properly qualified teachers for the special subjects. The physical education and art departments show the highest rate of turnover (see Table II). Principals and senior high-school and eighth-grade teachers show the lowest rate. The latter may be explained by the fact that these groups generally comprise teachers who have had considerable experience and who have definitely made teaching their life work.

TABLE II

AVERAGE ANNUAL TURNOVER IN CINCINNATI 1917–18 TO 1926–27

Grade or Department	Average Number of Teachers Employed	Average Yearly Turnover	Percent Turnover
(1)	(2)	(3)	(4)
Kindergarten	104.9	12.5	11.9
First grade	155.0	8.8	5.7
Second grade	137.3	8.9	6.6
Third grade	129.7	7.3	5.6
Fourth grade	129.0	6.7	5.2
Fifth grade	126.6	7.2	5.7
Sixth grade	117.4	6.7	5.7
Seventh grade	93.4	5.2	5.6
Eighth grade	83.6	4.0	4.8
Special classes	24.7	1.5	6.5
Art	19.2	3.9	20.3
Household arts	36.8	3.5	9.5
Industrial arts	38.7	4.8	12.4
Music	12.7	.6	4.7
Penmanship	10.3	.9	8.7
Physical education	34.3	7.9	23.0
Vocational	33.2	1.8	5.4
Junior high	46.1	2.5	5.4
Senior high	295.3	13.6	4.6
Principals	69.8	2.3	3.3
German	4.0	.8	20.0
Special schools	42.6	3.3	7.7
Totals	1,744.6	114.7	6.6

TABLE III

PERCENT OF TURNOVER IN THREE DIFFERENT GROUPINGS

Teachers	Death and Retirement	Resignation	Services Discontinued
(1)	(2)	(3)	(4)
Academic	32	63	5
Kindergarten	2	86	13
Special subjects	6	72	22

During the ten-year-period, about 69 percent of the annual turnover took place between the closing of schools in June and their reopening in September. The rest of the losses—31 percent—were during the school year. This indicates that a large number of replacements must be made while the schools are in session, an undesirable condition. An inspection of Table IV shows, however, that this condition has been decidedly improved. In 1917-18, 48 percent of the turnover occurred between June and September; in 1926-27, 79 percent of it occurred during the same period. This improvement has been brought about by several important changes. Prior to 1920, Cincinnati teachers were not required to pledge their services for the entire year by individual, written contracts with the Board of Education. Since 1920, the written contract has been required of every teacher. It should also be noticed that the largest turnover during a school year took place during the years of the World War and immediately thereafter when conditions generally were unsettled.

TABLE IV

TIME OF TURNOVER

Year	Total Number of Cases of Turnover	Percent Occurring between June and September 15
(1)	(2)	(3)
1917–18	110	48
1918–19	109	56
1919–20	108	51
1920–21	110	71
1921–22	114	79
1922–23	116	75
1923–24	118	79
1924–25	126	75
1925–26	116	72
1926–27	120	79
Mean	115	69

The extent to which each factor influenced turnover is indicated in the following table:

Cause	Percent
Death	7
Retirement:	
Compulsory, at age of 70	6
Voluntary after 36 years, before age of 70	7
Disability	3
Total	16
Resignation:	
Marriage	28
To teach elsewhere	17
To do other work	11
Home duties	6
Unsuccessful teaching	2
Ill-health	2
Moved away	1
Miscellaneous	1
Total	68
Services discontinued	9

The most important factors that cause teachers to resign are marriage, an opportunity to teach elsewhere, and a desire to leave the teaching profession. The most important factor in producing turnover is marriage which causes almost 30 percent of the entire turnover.

A rather large number of teachers leave the Cincinnati public schools to accept other teaching positions. The departments of physical education and industrial arts suffer far more from this cause than any of the other groups. About three-fifths of the teachers of physical education who resigned did so in order to accept other teaching positions. Many accepted positions in eastern cities where teachers of physical education were receiving salaries considerably higher than those paid in Cincinnati.

In 1926-27, Cincinnati adopted a salary schedule which compares favorably with the best in the country. It is significant that in that year the number of teachers leaving the Cincinnati schools in order to teach

elsewhere was the smallest in the ten-year period.

From the figures presented in this study, we may conclude that the decreasing rate of turnover in the schools of Cincinnati indicates a growing stability in the teaching staff. The salary schedule seems an important factor affecting turnover. The rate of turnover in the kindergarten and special-subject departments is excessive. This fact seems to indicate a serious lack of stability in these departments.

Marriage is the most important factor affecting turnover. Consequently, the most important task in reducing turnover is to reduce the number of withdrawals caused by marriage.

PRIMARY NUMBER IDEAS

HERETOFORE it has been customary to think of primary arithmetic and even all arithmetic as measured and defined by the terms "accuracy" and "speed." "Get the correct answer and get it quickly," has been the slogan of an ever-increasing constituency. Now we are brought face to face with incontrovertible evidence that "method of learning" is a third term which must be considered.

We have busied ourselves considerably with what children should be taught to do, and we have gone to great extremes in our insistence upon the speed with which they should do it. Professor Brownell, in a recent monograph, proves to us that we also shall have to look carefully into *how* they are doing it.[1]

This monograph is an outstanding contribution to the teaching of arithmetic in a field where contributions are seriously needed. It raises to the clear a neglected but fundamental element in the teaching and learning of arithmetic in the primary grades.

The importance of method is discovered first in Chapter II which describes a study of the difficulty children have in apprehending the numbers from 3 to 12, inclusive. The problem is approached by studying the responses of 1,858 children in the first seven grades of eight elementary schools when number pictures in various forms were presented to them.

The results of the experiment show that children apprehend concrete numbers on three rather distinct levels. The young child and those who are retarded in development see a concrete number as so many 1's to them. A group of seven dots is 1 dot and 1 dot and 1 dot and 1 dot and 1 dot and 1 dot and 1 dot. In the middle level of apprehension, the children are likely to see the same group as 5 dots and 1 dot and 1 dot or 4 dots and 1 dot and 1 dot and 1 dot. The final level is that in which the pupil sees 7 dots as 5 dots and 2 dots or 4 dots and 3 dots. In this stage he is ready for abstract number work in the usual form of memorizing the combinations. This stage cannot be reached except through the two preceding stages. This situation should present considerable food for thought to those who begin primary number work with the memorizing of the abstract combinations.

A further study of fifteen cases in Grade II-A indicates that the foregoing stages persist when the pupils attempt to memorize abstract combinations before reaching the proper level of efficiency in apprehending concrete numbers. Thus pupils who count when apprehending a concrete number do not really learn their combinations. They get the answer by counting. Pupils who have reached the second stage in the apprehen-

[1]Brownell, William A. *The Development of Children's Number Ideas in the Primary Grades.* Chicago, University of Chicago, 1928. (Supplementary Educational Monographs, Number 35)

sion of numbers (partial grouping) get the answers to combinations by solving the new combinations in terms of old ones that they already know. For example: Suppose a child who knows that $8 + 4 = 12$, encounters $8 + 5$ for the first time. He solves the latter combination by thinking $8 + 4 = 12$, 12 and 1 are 13. Only pupils who have fully mastered grouping (third stage) can learn their abstract combinations in the approved way.

For these reasons, mere drill is not sufficient even under the best of circumstances. We must examine further and find just what skills the children are practicing. Drill tends to improve skill in the learning stage which the child has attained. If he counts his combinations, drill enables him to count them more rapidly. If he gets the answer by solving the combinations, he improves in that level of work but does not rise to the higher level of learning. The application of speed to pupils who are using the primitive methods of learning merely teaches them to make more mistakes in a given time than they would have made otherwise.

The final study deals with learning to add three digits in a column. Here it is found that the two primitive types of procedure persist, leading to more and more errors of such kinds as mistakes due to counting, mistakes due to solving combinations, and a mixture of upward and downward addition.

Taken all in all, these studies constitute the most severe arraignment of primary number work that has appeared in this generation. Some readers of the monograph will receive a shock that will be unpleasant. All such folk should remember that our results in teaching arithmetic are nothing to be proud of. Now comes a study which points indisputably to some gross errors that have been made in teaching. In such a situation the suggestions for improvement with which the study closes should not fail to receive thoughtful consideration.

A few points of questionable nature appear in the study, but most of them are mere side issues. The one questionable point that is closely related to fundamentals and is so recognized by the author is the assumption that there is perfect correlation between the perception of concrete numbers as presented in certain patterns of dots and the comprehension of the meaning of numbers in general. Comprehension is certainly conditioned upon perception, but adequate comprehension may not result from the perception of one or a few dot patterns of special design.

One further point may be worth mentioning. The author uses the term "spanning" for what has generally become known as "bridging." Different names for the same thing are not conducive to scientific progress. It is to be hoped that no further names will be given to this important item in arithmetic learning and teaching.

In spite of all questionable points the fact remains that this study is the most valuable one that has appeared in this field. It seems safe to predict that the results which have been obtained will soon be reflected in current practice. Hope for improvement in the teaching of the fundamentals is by no means dead.

W. J. OSBURN

The authors of the Economy Remedial Exercise Cards are Greene, Studebaker, Knight, and Ruch rather than those listed on page 316 of this Bulletin dated October 17.

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W. W. CHARTERS - - - - *Editor*
JOSEPHINE MACLATCHY - *Assistant Editor*

Address all communications to the
BUREAU OF EDUCATIONAL RESEARCH
Ohio State University, Columbus, Ohio

GRADUATE SCHOOLS AND COLLEGE TEACHING

IN the current number of the *Educational Record*, Dean Haggerty of the University of Minnesota presents an interesting study from which he draws the conclusion that approximately seventy-five percent of our doctors of philosophy become teachers and only twenty-five percent enter non-educational occupations. In the seven major institutions which he studied the percentages range from sixty-two in the University of Minnesota to seventy-seven in the University of Chicago and Harvard University.

The figures justify Dean Haggerty in raising the issue that graduate schools are essentially institutions in which teachers should be taught both to do research work and to teach in higher institutions. We quote from Dean Haggerty's article:

> It may fairly be asked whether the time has not arrived to face squarely the obvious facts. The graduate schools of American universities are essentially teacher-training institutions and upon the kind of training which they offer and require of their doctorate candidates will depend the character of our college faculties and the quality of college education. Is it too much to ask that in this program of graduate training the student should be required to give some attention to the problems of education—problems which will constitute the student's chief concern once he is launched on his professional career?

Seventy-five percent of all persons receiving the Doctor's degree enter the teaching profession in teachers' colleges and universities. Approximately five hundred of them are engaged each year to give instruction to Freshmen, Sophomores, and upperclassmen in our institutions of higher learning. Frequently, in fact almost always, they have had no training in the principles or techniques of teaching. Few serious attempts are made to bring to their attention the literature regarding the functions and philosophy of education. They know college students chiefly from their own limited experience as individuals who have gone through college. Often these doctors were, while in college, studious individuals who mingled little in the social life of the undergraduates and understood but slightly the typical college student. All they know of teaching is what they have picked up casually in the classrooms as spectators of teaching. They have not studied the problems of constructing courses of study for college students. Of the newer movements in college education and the superior techniques of teaching they know only what they have casually picked up.

The Ph.D. knows the principles, the abstruse problems, and esoteric information of his field. In these he is competent. To adapt what he knows to undergraduates is a different problem. In the solution of this he is amateurishly incompetent.

Fortunately, a few graduate schools have faced the problem and have accepted the fact that they are teacher-training institutions. They are offering courses in college instruction for graduate credit although

no institution of which we know requires such courses for a teaching Ph.D. Of professionalized subject-matter courses for college teachers, we know not one. Much, therefore, remains to be done even in those institutions which recognize their obligations.

The chief obstacle in the way of the rapid expansion of the offerings of such courses lies in the dearth of textbooks on methods of college teaching, on the psychology of the college student, on management of college classes, and the like. If such books were available, the number of graduate schools to offer courses in education would increase at a surprising rate.

Upon the shoulders of men in the field of education squarely rests the responsibility for providing such books. The burden of blame for lack of training in teaching shown by young doctors of philosophy cannot be placed entirely upon the faculties of the graduate schools.

W. W. C.

THE NEW HUMAN INTEREST LIBRARY

Here is a set of six reference books offering, in story form rather than encyclopedic, supplementary material for children of elementary and junior high-school years.[1] As if guided by the colophon's legend, *Dictis factisque simplex*, each volume presents in simple and forceful language a definite unit of human interest, the extent of which is indicated by the titles of the volumes: *The Child and His World, Stories of Science, Great Industries, Our Country in Romance, Around the World*, and *Leaders of All Times*.

This reference tool has been prepared by an efficient staff of editors and contributors and is well supplied with authentic and appropriate illustrations. Selected bibliographies and carefully prepared volume indexes, together with a cumulative cross-index in the sixth volume, add much to the value and usability of the set. A feature—unusual in reference books—is the Rainbow Edition in which each volume is bound in a cloth of different color. This experiment of using colorful bindings for reference books—as bait for juvenile readers—should be highly successful if the experience of children's librarians is correct and will be followed with keen interest.

L. B. V.

THE study of differentiable mental traits is a twofold task which involves, first, devising tests A, B, C, and so forth, to find what independent mental traits are measured by these tests, and, second, constructing new tests—each of which measures one of these independent traits—for experimental purposes. Dr. Kelley has undertaken the first part of this task in a recent study.[1] The construction of new tests measuring the obtained independent mental traits is a problem for the future. The use of tests to measure some single independent trait or factor will be a long step toward the solution of such problems as guidance, selection, and classification.

Dr. Kelley used the following groups for this study of independent traits or factors: 140 seventh-grade pupils; 109 seventh-grade pupils, a part of the 140 seventh-grade pupils for whom there were additional data not given for the other 31; 160 third-grade pupils, given nine of the tests that were used for the seventh

[1] *The New Human Interest Library*. Chicago, the Midland Press, 1928, 6 volumes.

[1] Kelley, T. L. *Crossroads in the Mind of Man, a Study of Differentiable Mental Abilities*. Stanford University, California, Stanford University Press, 1928. 238 pp.

grade; 60 third-grade pupils, a part of the 110 third-grade pupils for whom there were additional data not given for the other 50; and 107 kindergarten children.

The independent traits or factors which were isolated were identified as follows: maturity or heterogeneity, a factor that would probably have been of much less importance had each of the populations studied been more homogeneous; verbal; arithmetic or number; memory; manipulation of spatial relationships; speed. In general, the same independent traits or factors were found for the third- and seventh-grade groups. It is suggested that the verbal, spatial, and memory factors are independent traits from a very early age.

Derivation of the formulas, discussion of the theory and technique, and a description of the tests used are included. Directions for giving and scoring the tests are given in detail.

HAROLD A. EDGERTON

THE FUNCTION OF THE DEPARTMENT OF STATISTICS AND RESEARCH IN THE PUBLIC-RELATIONS PROGRAM

L. C. BAIN
Cleveland Public Schools

(*Continued from the issue of October 31*)

SPECIAL FACTORS AFFECTING SCHOOL EXPENDITURES IN RAPIDLY GROWING CITIES

SUCH a part of the public as can be interested should be informed that a rapidly growing community is likely to have, even for what seems to be an equivalent school program, a lower per-pupil expenditure than a slowly growing or static community. At least three factors contribute to this condition. (1) The degree to which a school enrollment is adequately housed is a measure of the per-pupil expenditure. Rapidly growing cities find it difficult or impossible to construct school buildings as fast as they are needed, and the congestion which follows results in a larger number of pupils per room and per teacher with an accompanying lower expenditure per pupil for maintenance, operation, and teaching service than would obtain if the buildings housed only their normal capacity. The converse is true for any district where the buildings are not filled to normal capacity and the groups are below average size. (2) A rapidly growing school system needs many new teachers who can be placed in the system at the lower steps of the salary schedule. This reduces the median and average salaries and the average per-pupil expenditure for teachers' salaries. (3) A third factor which may operate in certain rapidly growing communities to hold down the per-pupil expenditure is that, on account of lack of buildings, the educational program to which the administration is pledged cannot be carried out throughout the city. This is especially true in the case of the schools that are endeavoring to change over from the 8-4 plan to the 6-3-3 plan or to develop special programs to meet the needs of atypical children.

Expenditures for schools in relation to the enrollment.—Frequently the public is told that in the past fifteen

or twenty years, school expenditures have increased out of proportion to the increase in enrollment. It is fortunate that these statements are true; otherwise the children of America would be getting the most meager program of education in the history of public schools. The school could not escape, during this period, the same economic factors that have been increased, personal, family, and governmental expenditures; it requires the services of men and women who must live in the same general surroundings and under the same general economic conditions as those engaged in other kinds of work. The school must buy coal, light, power, building materials, and miscellaneous items of supplies on the open market and pay the market price. Its dollars are the same as other dollars; the kind that for 1927 had decreased in purchasing power 36 percent since 1910 and 35 percent since 1913.[1]

Not only the relation of expenditures to the increase in enrollment should be considered. School officials must also know whether expenditures have increased proportionately to (1) the increase in salaries and wages in other fields; (2) the increases in the amounts expended for other functions of local and state government; (3) the changes in the character of the enrollment; (4) the increases in the prices of the commodities needed by the schools; and (5) the increased demands which have been met by the public schools.

Current expenditures of the Cleveland public schools for the school year 1913-14 totalled $3,601,320. For the school year 1926-27, current expenditures amounted to $16,480,197—about five times more than the 1913 current expenditures. Increased enrollment and changes in the character of the enrollment were factors entering into this increase, but the large increase may not be attributed wholly to increased enrollment.

For the Cleveland schools, the 1926-27 enrollment factor alone, from an expenditure standpoint, warranted current expenditures only 1.87 times as great as those of 1913-14. On this basis the 1926-27 current expenditures would have amounted to $6,734,468; but $16,480,197 were expended—an amount 2.45 times as great as would be warranted if enrollment were the only factor affecting school expenditures during the thirteen years. This increase, however, checks very closely with other significant increases. Data are available that indicate that the increase—2.45 multiple—for school expenditures since 1913 is not excessive.

A board of education is a purchaser of services rather than of materials: approximately 85 percent of the current expenditures of the schools are paid direct to those employed by the boards of education. Changes in wages and salaries in general must necessarily affect the current expenditures of the schools. Economic law makes it mandatory that boards of education pay salaries and wages comparable to those paid in other fields if they are to secure and retain the services of those who, by inheritance and training, are well qualified to work constructively in the public schools.

What changes have wages and salaries undergone? The *Monthly Labor Review* of the United States Labor Statistics for November, 1927, states, "Union wage rates per hour were nearly three times as much in 1927 as in 1910, and more than two and one-half times as much in 1913." Data also show that in 1925 the average income of all persons gainfully employed had increased only

[1] Dunn's Index Numbers: for 1910, 118.803; for 1913, 120.886; for 1920, 247.888; for 1927, 187.092.

about 5 percent less than wages for labor since 1913.[1] These data show that the changes in social and economic conditions have operated to effect practically the same increase in school expenditures which they have brought about not only in the wage scales of the trades, but also in the average compensation of all persons gainfully employed.

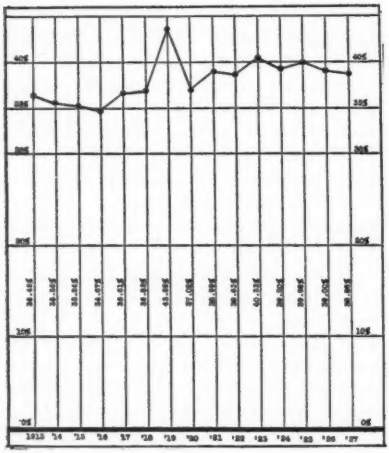

Figure 2. Percents of total tax levies received by Cleveland public schools, Cleveland, Ohio, school district tax years 1913 to 1927

The second item to be discussed under the general heading of enrollments and expenditures is the extent to which school expenditures have absorbed the total revenue from the local property tax. The percent of the total tax rate for the local district which was used by the schools can be determined for the beginning and the end of a 15- or 20-year period for which a comparison may be desirable. While the basis for assessing property may have changed during the period, for any one year, the basis would be practically the same for the school taxes as for any other local taxes. This fact makes the percents of the total taxes received by the school for each of the several years comparable figures. In this way it may be shown to what extent, if any, the school is now receiving a greater share of the total taxes than it received fifteen or twenty years ago. Since 1913, the minimum percent of the total local taxes received by the Cleveland schools was 34.67 percent in 1916 and the maximum, 43.55 percent in 1919. The actual median was 38.63 percent in 1922 and 38.88 percent for 1927; the average for the fifteen-year period, 38.06 percent. Figure 2 gives detailed data for the fifteen years since 1913.

The assessed valuation back of each pupil in the school is a factor which should enter into any study of taxes, for on this item hinges much of the community's ability to support education. The per-pupil expenditure might be greater in one community than in another, yet the tax burden might be much lighter in the community having the greater per-pupil expenditure. The basis for evaluating property is also another variable: this applies even within the boundaries of the same state. There are valid points in the argument that a community's ability to support education is not always reflected in the tax duplicate. Much of its wealth may exist in nontaxable forms.

The third item for consideration under this subject of enrollments and expenditures is the change in the character of school enrollment. The enrollments in the more expensive activities of the schools have increased more proportionately than has either

[1] National Education Association, Research Division. "Advance of the American School System," *Research Bulletin of the National Education Association*, 5: 220, September, 1927. *See* Chart XV.

the total enrollment or, more significantly to the point, the enrollment in the regular classes from Grades I to VI. These "more expensive activities" are the junior and senior high schools and the special classes and schools for atypical groups.

The data given in Table IV show the extent to which the character of the enrollment has changed in the Cleveland schools in the past twenty years. Data for other schools would show the same significant facts. These figures make clear two distinct points. First, the distribution of the 1907 enrollment differs greatly from the distribution of the 1927 enrollment. In 1907 only 18 percent of the enrollment was found above the sixth grade; in 1927 more than 32 percent was found above the sixth. The enrollment in special schools and classes increased from .6 percent of the 1907 enrollment to 6.9 percent of the 1927 enrollment, as is shown in Columns 3 and 5. Second, the gains in the enrollment are not distributed proportionately to the 1907 enrollment. The rates of increase have been many times greater in the most expensive activities. Regular classes for Grades I to VI increased only 63.8 percent. Grades VII and VIII increased 258.9 percent; Grades IX to XII, 445.3 percent—the junior high school has developed within this twenty-year period. The enrollment of special classes and schools has advanced 2,601.4 percent. These figures are given in Column 7 of Table II.[1]

TABLE IV

CHANGES IN CHARACTER OF ENROLLMENT IN CLEVELAND DURING PAST TWENTY YEARS

ACTIVITY	JUNE ENROLLMENTS				INCREASE—1927 OVER 1907	
	1907		1927			
	Number	Percent	Number	Percent	Number	Percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kindergarten	1,852	3.1	9,143	6.5	7,291	393.7
Grades I to VI (regular classes)	45,986	78.0	75,303	53.7	29,317	63.8
Grades VII and VIII	6,348	10.8	22,784	16.2	16,436	258.9
Grades IX to XII	4,262	7.2	23,241	16.5	18,979	445.3
Special classes and schools	358	.6	9,671	6.9	9,313	2,601.4
Cleveland School of Education	194	.3	301	.2	107	55.2
Totals	59,000	100.0	140,443	100.0	81,443	138.1

The effect of the changing character of enrollments on current expenditures can be approximated by the simple technique which follows. The scheme is to convert the enrollment for each activity in the school into an equivalent enrollment, from an expenditure standpoint, in Grades I to VI. The totals would be approximately comparable enrollments on an expenditure basis. The steps are:

1. Determine average daily enrollment in each activity.

[1] *See* page 321, preceding issue of BULLETIN.

2. Determine per-pupil expenditures for each activity.
3. Determine current-expenditures ratio or multiple for each activity by dividing the per-pupil expenditure in the activity by the per-pupil expenditure in regular classes. Grades I to VI.[1]
4. Multiply the average daily enrollment in each activity by the multiple obtained in Step 3. The product from an expenditure standpoint is the equivalent of the enrollment in that activity in terms of pupils enrolled in regular classes Grades I to VI.
5. The sum of the products found in Step 4 gives the total enrollment for the year in terms of pupils enrolled in regular classes, Grades I to VI. The per-pupil expenditure in regular classes, Grades I to VI becomes a unit for measuring the total expenditure.

Commodity prices also enter into the problem of school expenditures. One critic complained that the product of the public school has not improved with the increased expenditures. This may or may not be true depending quite largely on one's definition of education. Is the quality of a product over a period of years directly proportional to its cost? Does a ton of coal that in Cleveland cost $9.00 on October 15, 1927, contain twice as many thermal units as the ton of the same kind that cost $4.15 on January 15, 1913? Or are the common bricks which cost $13.95 per M in 1927 better than the common bricks which cost $6.80 per M in 1913? The point is that commodity prices, or index numbers, must be considered in school expenditures: the schools can no more escape general economic conditions than individuals or other departments of the government.

Under the subheading of the increased demands which have been met by public schools may be listed the enforcement of school-attendance laws, contributions of the Boards of Education to teachers' retirement funds, extension of health activities, community centers and playgrounds, and the development of a program of adult education. The list of such items varies considerably with the different localities. However, every school system has met some such demands.

[1] *See* Table I, page 320, preceding issue of BULLETIN.

EDUCATIONAL RESEARCH IN THE PUBLIC-RELATIONS PROGRAM

That part of the public whose interest in its school system extends beyond its expenditures will want to be assured that the school is functioning satisfactorily and progressively in the classroom. Mere opinion will not suffice to give this assurance. Only that type of information which reveals the results of the school at work will meet the demands of this group. This is a fortunate condition for the children in the school as well as for the administrator, because it tends to improve the quality of instruction and to place a premium on the administrator who brings about and maintains a high quality of instruction.

Educational research is work involving so great an amount of time-consuming detail that only in the smallest school systems will a superintendent have time, except in a general way, to direct research work. It is a long step from a series of achievement tests given in the classrooms to a statement which the superintendent may give to the public that will show objectively what is being accomplished on accepted standards of achievement. The preparation of this valuable type of information is clearly a function of a research worker.

It is then the function of a Department of Statistics and Research to evaluate the school system on the basis of organization, curriculum, instruction, and achievement and to

report its findings to the superintendent in a clear, concise way, free from such technical terms as would obscure the meaning to the layman. Such information should enable the superintendent to reveal the school to the public as a dynamic thing. The findings of the Department of Statistics and Research should show, first, the school's organization regarding accepted principles of education and psychology for school organization; second, its curriculum with reference to accepted standards of curricula and curriculum-making; third, its teaching personnel: training, experience, and classroom skills as reflected in pupil activity; and, fourth, its progress with accepted standards of achievement. Here again is a situation in which the weaknesses of the system as well as its merits may be made known. The confidence of the public will be needed for correcting certain weaknesses which, through research, may be shown to exist in the educational processes of the school.

SUMMARY

1. The object of the public-relations program is to create confidence in the school.
2. The superintendent is the leader in education for the community as well as the chief executive officer of the public-school system. The public therefore, looks to him for information on all phases of its school system. However, it may well be the function of someone on the superintendent's staff to aid him in choosing, arranging, and correlating material for publicity purposes, and finding ways and means of securing appropriate publicity.
3. Much material having publicity value is the product of statistical and research work.
4. Statistical and research work is so detailed and consumes so much time that the superintendent cannot, in justice to his position, carry on such work.
5. The Department of Statistics and Research should prepare material for the superintendent that will aid him in interpreting the schools to the public. If it fails in this function the Department does not merit the confidence and support of the administration and school system.

THE USE OF ACTIVITY ANALYSIS IN CURRICULUM CONSTRUCTION

(*Continued from page 348*)

required courses should deal with activities of women which are carried on by them irrespective of occupation, we find, according to certain judges who reviewed the data, that the following courses should be required for women: (1) physical health—physiology and hygiene; (2) mental health—psychology of a certain type; (3) communications—English composition; (4) aesthetic appreciation; (5) citizenship—general social science; (6) a course on social relations; (7) a course on consumption; and (8) an integrating course consisting of a combination of philosophy, ethics, and religion.

Illustrations might be multiplied, but enough have been given to show the uses of activity analysis in the construction of curricula for investigators who accept the functional point of view. Activity analysis is merely a constellation of techniques among many techniques. It supercedes "hunches," informal opinions, and individual judgments by careful, painstaking, and costly investigation. Selection of material for the curriculum is inevitable. It has always been necessary.

Activity analysis makes selection more objective because it provides a clear picture of the substantial bases of selection. The permanence of the techniques is beyond debate. They are here to stay. The usefulness of activity analysis is dependent upon the industry and intelligence of its friends and is closely correlated with the providing of increasingly simple and efficient techniques. It is a form of educational engineering which lays out the structures and the substructures of all kinds of curricula.

ON THE FIRING LINE

Mr. U. E. Diener recently resigned the superintendency of the Celina schools to accept a similar position at Van Wert.

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Art and commercial subjects have been added to the high-school course of study at Shaker Heights this year. German has again been added to the curriculum.

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Cleveland Heights schools began this year with approximately five hundred additional students. A steady ten-percent growth is continuing, and expansions are planned to meet its demands on the school system.

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During the first week in September Dr. W. J. Osburn who is jointly a member of the faculty of Ohio State University and of the State Department of Education delivered a series of lectures at the teachers' institute at Morristown, Pennsylvania. His subject was "The Results of Research as They Affect the Work of the Classroom Teacher."

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Superintendent F. H. Bair says that they are using a modified platoon scheme in the largest elementary school of Shaker Heights. The home-room teachers teach the three R's and social studies, while special teachers give the instruction in art, music, physical education, and science. Special supervisors direct the pupils while in the library and in the auditorium.

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The school children of Knox County have competed in penmanship and spelling contests for several years. The improvement in these subjects which seemed directly traceable to these contests has been so marked that the members of the County Board of Education have decided to inaugurate a similar contest in arithmetic this year.

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An extensive study is being made in the ninth- and tenth-grade English classes in Cleveland Heights concerning practical English grammar. Pribble-McCrory Diagnostic Tests are being used for this purpose; and after the results are tabulated the Supervisory Staff will make definite suggestions for overcoming the difficulties which have been found as a result of study.

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Mr. Edgar H. Blain, assistant county superintendent, will have charge of the art work in Medina County during this year. He is to be assisted in his work by three supervisors who will devote their entire time to teaching and directing the art work throughout the county. Art is to be required in the first six elementary grades; in the junior and senior high schools the course is to be elective.

The eighth elementary-school building of the Shaker Heights system will soon be completed. This school will provide accommodations for eight hundred pupils.

A bond issue of $1,250,000 was presented to the voters of the Shaker Heights village school district at the November election. If passed, a large percent of this money will be used to build and equip a new high school. In 1920 the school enrollment in Shaker Heights village was five hundred; it has now reached twenty-seven hundred.

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Superintendent Pierce of Painesville has appointed three committees to study school problems during the year. The first committee will investigate the problems of semi-yearly promotion. The second will arrange a program of tests and measurements. The third committee will investigate the course of study. The work of the third committee, according to the superintendent's opinion, will probably be the most important interest of the school system during the year.

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The Council of the Cleveland Heights Branch of the Ohio Congress of Parents and Teachers is to cooperate with the Board of Education in bringing Sir John Adams to Cleveland Heights during January. His talk before the teachers will be on "The Ideal Teacher," and the one before the parents and teachers, on "The New Education."

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Mr. F. D. Swigart has been appointed superintendent of the Celina schools. For the past three years he has been principal of the high school. Mr. Dwight W. Davis has been promoted to the vacant principalship. Both of these men are working toward their Master's degrees—Mr. Swigart at Ohio State University and Mr. Davis at the University of Chicago.

EDUCATING THE CRIPPLED CHILD IN BELMONT COUNTY

The Belmont County School for Crippled Children, located at Barnesville, is this year doubling the work attempted during the other two years of its existence. One room and one teacher filled the need formerly, but now two rooms and two teachers are required for the twenty-five children enrolled.

The children come from twelve different towns in the County, arriving on Monday morning and returning to their homes on Friday evening. Good homes are provided them during the week and two taxicabs carry them to and from school daily. Four of the children live in Barnesville.

The pupils are enrolled in all eight grades with one teacher conducting the work of the first four grades, and the other the upper grades. Of particular educational interest is the work being done with the older children. Instead of the usual graded class work, a modification of the Dalton laboratory plan of instruction is used. These crippled children offer an especially good opportunity for such a plan, since they come from so many communities and with such varying degrees of academic achievement. Each child is permitted to progress at his own rate. Group competition, class recitation, and conferences are made use of, to keep every one working with a high degree of interest.

Manual training, sewing, and other forms of "extra" work introduced by the art and music supervisors as well as the regular teachers, together with the progress made through use of the plan already mentioned, make up an educational experiment, the results of which promise to be of unusual interest and benefit.

PAUL V. BROWN
Superintendent of Schools

EDUCATIONAL READINGS

JOHNSON, PALMER O. *A Comparison of the Lecture-Demonstration, Group Laboratory Experimentation, and Individual Laboratory Experimentation Methods of Teaching High-School Biology*, *JER*, 18:103–11, September, 1928.

Professor Palmer presents in this article a controlled experiment in which three types of science teaching are compared. He tested not only in terms of immediate recall, but also for delayed recall and checked as carefully as possible the statistical significance of his results. He found, in general, that no significant difference existed between results obtained from the group and individual methods. The demonstration method outranked the others in five of the six sets of experiments, although the differences obtained were too small to be statistically significant. The individual method seems to provide greater opportunity for exercise of individual differences.

LANDSITTEL, F. C. *Scholastic Accomplishment in the Junior High School*, *JER*, 18:127–35, September, 1928.

Dr. Landsittel herein reports the achievement of 371 pairs of university freshmen in three school branches, science, mathematics, and foreign languages. The course of preparation for college taken by one member of the pairs led through junior and senior high school; that taken by the other, through an 8-4 type of organization. The results indicate that the junior high school does not make for superior scholarship. "The new school has failed thus far to justify itself in regard to the central objective of education; viz., intellectual cultivation."

GARLIN, R. E. *Factors Conditioning the Success of School Surveys*, *S&S*, 28:337–40, September 15, 1928.

This is an article of real value to anyone contemplating a school survey as an aid in putting across an educational project. Twenty-one states and forty-eight cities reported 25 factors contributing to the success of school surveys. Special emphasis is given in this discussion to factors presumably under the control of publicity. These are classified as the need for organization in survey publicity, the need for adequate publicity, the importance of securing the leadership and active help of certain groups, and the need for observing certain general methods in school-survey publicity. The ultimate success of any school survey seems to hinge largely upon proper publicity.

CLARK, HAROLD F., AND FOWLKES, JOHN GUY. *Index Numbers for School Supply Prices*, *NS*, 2:46–48, September, 1928.

In this article, data are presented on the present practices in the selection and purchase of school supplies in one hundred cities ranging from 2,000 to more than 350,000 population. These data indicate no agreement relative to time of purchase. On the basis of catalogue prices, annual and monthly index numbers for instructional supplies have been calculated. Using 1926 as the base year, during the period September, 1927, to September, 1928, the monthly index of prices ranges from 93.6 in May to 95.2 in October. According to these indices, then, the months of April and May are best for purchasing instructional supplies.

CRECELIUS, PHILIPINE. *Ability Grouping and the Junior High School Idea*, *CSJ*, 11:20–23, September, 1928.

The method of grouping pupils in the Ben Blewett Intermediate School, St. Louis, is described and set up as an administrative device to improve instruction. Bases for grouping include not only intelligence and achievement quotients, records in previous grades, and teacher judgment: the grouping is also based on a general maturity made up of such elements as mentioned above, together with sex, state of health, general physical condition, and social growth. This school does not satisfy itself with the mere mechanics of ability grouping, for a curriculum is devised to fit the groups. The aim is to use such situations for junior high-school pupils that their interests and abilities are challenged.

MCCRORY, JOHN R. *A Comparative Study of Two Groups of Teachers-College Students*, *EAS*, 14:469–75, October, 1928.

Students taking the two-year course at State Teachers College in St. Cloud, Minnesota, showed a slight intellectual

NOTE.—The abbreviations used in this number are: *JER*, Journal of Educational Research; *S&S*, School and Society; *NS*, Nation's School; *CSJ*, Chicago Schools Journal; *EAS*, Educational Administration and Supervision; and *ESJ*, Elementary School Journal.

advantage over those in the one-year course, according to the Otis Self-Administering Test. On the average, the two-year people were a little younger; had a little higher scholastic record in both high school and college; and were a little more variable in their scholastic achievement than were the one-year people. The average one-year students, however, accomplished more nearly up to their abilities than did the two-year students.

DOUGHERTY, MARY L. *What Changes the I. Q.? ESJ*, 29:114-21, October, 1928.

Two boys with initial intelligence quotients of 84 and 134 respectively, as based on a Stanford-Binet test, increased them to 101 and 156 respectively when re-tested one year after the first test was given. In the case of the boy whose intelligence quotient jumped from 84 to 101, there were several environmental changes in the home which might account for part of this apparent change. In the other case no reason was found. The article gives in detail the results of the two tests given to each boy.

IN PAPER COVERS

BROWN, MAUD A. *Fargo and the Health Habits*. New York, Commonwealth Fund, Division of Publications, 1928. 32 pp. (Child Health Demonstration Committee, Reprint No. 8)

This bulletin reports very briefly the experience of Fargo teachers and children during the five-year health demonstration. So successful was the work in the schools that the city school system now has a supervisor of health education. The report given here demonstrates the superiority of the project method in teaching.

LABRANT, LOU L. *Diagnostic Tests and Remedial Measures for the Teaching of English in the High School*. Lawrence, Kansas, University of Kansas, 1928. 24 pp. (University of Kansas Bulletin of Education, Vol. I, No. 7)

The purpose of this pamphlet is "to outline for the department of English in high school a suggestive procedure of diagnostic testing, intended to discover not only the comparative degree of the child's achievement, but details of his difficulties, and, whenever possible, the cause of these difficulties." Tests which may be used in diagnosis are mentioned, and remedial measures which in most instances have sanction from the author's personal experience are suggested.

WORLD FEDERATION OF EDUCATION ASSOCIATIONS. *School Health Programs from Many Lands*. New York, American Child Health Association and Metropolitan Life Insurance Company, 1928. 209 pp.

From the program presented before the meetings of the Health Section of the World Federation of Education Associations which met in Toronto in 1927, the papers given in this book were gathered. School health programs from many countries are described, and health work at all levels of the educational system are discussed.

STRICKLER, FRED. *The Training and Experience of 480 Industrial Arts Teachers*. New York, Teachers College, Columbia University, 1927. 115 pp.

The purpose of the scientific study made of 480 industrial-arts teachers, representative of all classes of teachers in representative school systems and educational institutions, was to find out the more theoretical, non-technical elements and phases of the training of industrial-arts teachers, and to discover the professional and trade experience of present teachers. The results are presented in a way helpful to all persons interested in working in, preparing for, or preparing others for, the field of industrial-arts education.

FOSTER, OWEN I., AND OTHERS. *Some Phases of the Junior College Movement*. Bloomington, Indiana, Bureau of Cooperative Research, Indiana University, 1927. 125 pp. (Bulletin of the School of Education, Indiana University, Vol. IV, No. 1)

The Bureau of Cooperative Research of the College of Education, Indiana University, presents here a survey study of junior colleges in the United States. The reliability of the report is lessened by the fact that only a small number of colleges replied to the several questionnaires sent out. An analysis is given of junior-college standards as set up by accrediting agencies, and the legal status of the unit in the various states is discussed. Findings are presented on the costs of operating the junior college; and, finally, there is reported the survey of the curricula in the light of various accepted objectives.

The study is a worth-while contribution to the junior-college field. It gives much valuable information on trends in the development of the junior college and particularly furnishes a foundation for further investigations in the several phases of the problem.

DAWSON, HOWARD A. *Standards of Expenditures for the Principal Items of City School Costs.* Nashville, Tennessee, George Peabody College for Teachers, 1927. 173 pp.

The scope of this study is limited to 312 cities of ten thousand to thirty thousand population. On the basis of six quantitative measures, each of these cities is given a composite school efficiency score. The practice found in the upper half of these cities—ranked on the basis of school efficiency—is taken as the criteria for setting up standards for the distribution of school money among the several functions. These standards are expressed in terms of twelve formulas based on what is designated as the standard teaching unit.

The practice of eighty of these cities is made the basis of estimating the minimum amount of money in relation to the taxable wealth which a community might spend for public education. The data assembled constitute a valuable basis for comparative purposes.

BOOKS TO READ

CARR, WILLIAM G. *Education for World-Citizenship.* Stanford University, California, Stanford University Press, 1928. ix + 225 pp.

Here is another book to be added to the "black lists" of so-called "patriotic societies," since its aim is to show teachers what the schools may contribute in a program for the attainment of world peace. The author does not propose new theories or teaching devices; rather he presents a survey of published thought on educational aspects of world-citizenship. Each of the eleven chapters is followed by an annotated list of selected references. If the teacher acquaints herself with the literature in those lists, she will have a broader concept of factors in international relations.

WHIPPLE, HELEN DAVIS. *Making Citizens of the Mentally Limited.* Bloomington, Illinois, Public School Publishing Company, 1927. vi + 363 pp.

The author states that this book was written for the purpose of arranging a curriculum that should present a composite of the best practices of the best teachers she had observed and at the same time conform to the principles that psychologists agree should govern the training of the subnormal. In Chapter I, the general pedagogical principles are set up followed by chapters on the daily program, character training, and citizenship. These are followed by chapters in subject fields wherein objectives, methods, and materials are discussed for each of these. Most city school systems now devote considerable time, effort, and money to the segregation of subnormal children, but very little of this effort is spent on working with them after the segregation. In providing concrete, usable materials for the supervisors and teachers who are charged with the responsibility of instructing these children, the author has made a worth-while contribution.

SMITH, HENRY LESTER, AND WRIGHT, WENDELL WILLIAM. *Tests and Measurements.* New York, Silver Burdett and Company, 1928. vi + 540 + ixpp.

This is a rather extensively complete treatise in its field. A wide list of subjects is listed in the book. Of special interest are such topics as the criteria for judging standardized tests and the methods of interpreting scores. Practically all of the school subjects, elementary and secondary, are included for brief discussion. The various available tests are listed and evaluated. The author also includes a valuable consideration of prognostic and special aptitude tests and the principles involved in constructing achievement tests. That the value of testing may be realized only when it results in remedial administration is brought out in the discussion.

ATWOOD, WILLIAM H., AND HEISS, ELWOOD D. *Educational Biology.* Philadelphia, P. Blakiston's Son and Company, 1928. xi + 469 pp.

This is a textbook designed for first-year classes in normal schools and teachers colleges. Its stated aims are: "(1) to give a general outline of the scope of biology and its relation to the other sciences and to education; (2) to develop scientific attitudes which may aid the teacher in evaluating educational theories and problems; (3) to provide a biological basis for a better appreciation and understanding of other teacher-training subjects; (4) to give the student a rational basis for interpreting the important biological problems; (5) to give an understanding of the general principles and theories of science which are of importance in liberal education."

This text seems to satisfy the need for a new treatment of educational biology. It is well illustrated and comprehensive. Attention is concretrated upon fundamentals; unimportant details are omitted.